MEMORANDUM

FROM: Members of the Rails-to-Trails Phase II Lighting Ad-Hoc Committee

TO: Mayor and Town Council of the Town of Milton

SUBJECT: Recommendations for Lighting on Phase II of Rails-to-Trails in Milton

WHEREAS: The Town of Milton has been awarded a grant from the Delaware Land & Water Conservation Trust Fund under the Outdoor Recreation, Parks and Trails Program ("ORPT Program"); and

WHEREAS: The Town of Milton Resolution 2020-022 established and appointed members to the Rails-to-Trails Phase II Lighting Ad-Hoc Committee; and

WHEREAS: Said Committee met on November 30, December 8, December 16, and December 23, 2020; and

WHEREAS: Said Committee has reached its conclusions.

NOW, THEREFORE, BE IT MADE KNOWN by said Committee members, that the following recommendations are unanimously approved for submittal to Mayor and Town Council.

General:

1. Our terminology includes that Federal Street is the Eastern side of the Trail, and that the direction towards Federal St is East; that Lavinia Street is the Western side of the trail, and that the direction towards Lavinia St is West; that the side towards the Wagamons West Shore development is North; and that the under-developed side is South.

2. The Lighting recommendations are segmented into three segments as follows:
    a. The "Federal" segment extends from Federal Street to the Eastern end of the trestle bridge.
    b. The "Little Hill" segment extends from the Western end of the trestle bridge up the hill to entrance of the trail at West Shore Drive.
    c. The "Lavinia" segment extends at the same elevation as the balance of the trail from the Western edge the Little Hill segment to Lavinia Street.

Specific Recommendation for the Federal segment:

1. Install a total of four lights, all to be supplied and maintained by Delmarva Power. The lights shall consist of three Grandville Lights to be the same height as those in Phase I and one Shoe Box light. All of the lights shall use High Pressure Sodium bulbs to conform with the rest of the Town.
    a. Place the first Grandville light 150 feet from the last light in Phase I of Rails-to-Trails. This puts it at about 80 (+ or -) feet from the Federal Street entrance to the trail.
    b. Place the second Grandville light 176 feet from the first one.
    c. Place the third Grandville light 176 feet from the second one.
    d. Place the East Side Shoe Box light (4th light overall) 150 feet from the third Grandville. This Shoe Box light shall have additional shielding at the rear side to further shield light from trespassing in the northerly direction.

Specific Recommendation for the Little Hill segment:

1. Install a total of five lights, all to be supplied and maintained by Delmarva Power. The lights shall consist of four Grandville lights and one Shoe Box light. All of the lights shall use High Pressure Sodium bulbs to conform with the rest of the Town.
    a. Place the Shoe Box light (second Shoe Box/5th light overall) 160 feet from the other Shoe Box light. In combination with the other Shoe Box light, this will provide extra lighting on the trestle bridge itself. This Shoe Box light shall have additional shielding at the rear side to further shield light from trespassing in the northerly direction.
    b. Place the next Grandville (6th overall) 160 feet from the fifth light on the North side of the trail. This will be essentially at (or very near) the departure point ("Y") from the main trail into Wagamons West Shore. This light should be shielded to limit the light trespass into the Ingram Branch, the surrounding wetland, and any homes that might be affected but shining upon the entire area of the trail in the vicinity of the light.
    c. Place the next Grandville (7th) on the same side of the trail, 136 feet from the 6th one. This will be about halfway up the hill. This light shall also be shielded to limit the light trespass into the Ingram Branch, the surrounding wetland and nearby home(s) on the east side of the entrance to the trail.
    d. Place the next Grandville (8th) on the other side of the trail 136 feet from the 7th one. This will be near the back of the corner property, and close to the beginning of the fence on the west side of the trail. This light shall be shielded so as to limit the light trespassing on the adjacent home. Lights # 6,7, & 8 shall be the same height as the Grandvilles in Phase I.
    e. Place the last Grandville (9th) across West Shore Drive, directly in front of the entrance to the trail. This light shall be shielded to limit the light

trespassing on the properties behind the light. This light shall be the same height as the others in the Wagamons West Shore development.

Specific Recommendation for the Lavinia segment:

1. The Lavinia segment shall be lighted with directional LED bollard lights having the following characteristics:
    a. The light fixture shall be inclined at approximately 15° to shine downward in order to light only the 10' width of the trail with an elongated asymmetrical photometric distribution along the length of the trail. The light shall be shielded so as to prevent light trespass behind the bollard and to limit skyward light trespass.
    b. The bollards shall be placed 60 feet apart.
    c. The lighting shall be efficient and soothing, and ideal for pedestrian and cycling paths. The LED temperature shall be as low as possible, but no higher than 3000K. This is to avoid, as much as possible, that bright blueish white that emanates from higher temperature LEDs. 2700K is preferred to keep the color as close as possible to that of the high-pressure sodium lights to be installed on other trail segments.
    d. The bollards shall have a maximum height of 4 feet.
    e. The lights shall have photosensitive switches, such that they turn on at dusk and off at dawn.
    f. The lights on this segment shall all be installed on the north side of the trail. The Eastern-most bollard shall be installed between the backs of 202 and 204 West Shore Drive, 381 feet from light #6 on Little Hill.
    g. The lights shall be equivalent or nearly equivalent (with respect to the ability to provide lighting on the trail) to the Ragni-Lighting Kassio 1200 directional lighted bollard with the following characteristics:
        (1) Approximately 1200 mm high;
        (2) 21 to 24 volts to supply an 8 LED module;
        (3) 500 ma power current;
        (4) Lowest color temperature offered, even if it is only offered as an option, so as to keep the shade as "warm" as possible and as close to that exhibited by the high-pressure sodium lights throughout the rest of the Town;
        (5) CRI above 70;
        (6) Built from the materials designed for outdoor, wet and snowy weather;
        (7) Painted black.

Additional Comments:

The Ad-Hoc Committee recommends that a single Request for Proposal be prepared and issued to Electrical Contractors so that the successful bidder will install all the

conduit; pull all the cables; supply the directional bollards; install all the Shoe Box lights, Grandville lights and directional bollard lights; and make the required connections, so that fully operational lighting systems are installed in all three segments by the single contractor. Our reasoning for this is to expedite completion by the required date stated in the Grant Agreement.

The Ad-Hoc Committee recommends that all lights be installed in the existing Rights-of-Way/Easements.

The Ad-Hoc Committee recommends that reflectors be placed on the fencing along all three segments to increase awareness of the location of the fencing, and to provide some additional reflected light. Ideal locations include the posts facing the trail where the fencing begins, turns and terminates.

The Ad-Hoc Committee recommends that Delmarva Power install three connection boxes: one near the Federal Street entrance to supply the Federal segment, one near the West Shore Drive entrance to supply the Little Hill segment, and one near the Lavinia Street entrance to supply the Lavinia segment. Such boxes to be installed in existing Utility Easements.

Approved:

James C Garde, Chairman

Randi Meredith, Member

Derrick Harvey, Police Chief & Member

Steven Callahan, Member

Lee Revis-Plank, Member

Miklos Mathe, Member

Walter Tydings, Member

Concur:

Greg Wingo, Town Liaison

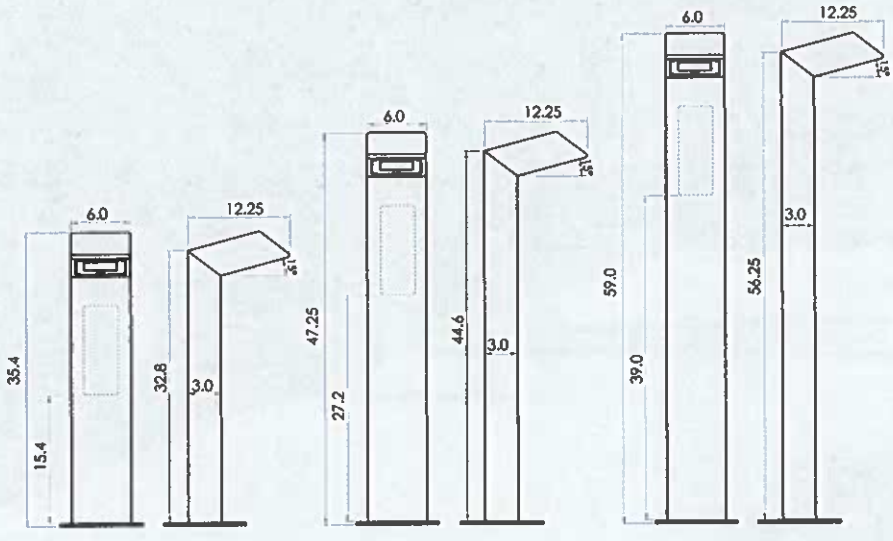

KASSIO
Bollard Range
www.ragni-lighting.com

KASSIO

Technical characteristics

	Kassio 900	Kassio 1200	Kassio 1500
Hauteur (in)	35.5	47.25	59.0
Poids (lbs)	44	55	66
Protection index			
Optical unit		IP 66	
Énergie de choc / Shock resistance		IK 10	
Materials			
Body		Gavanized steel	
Head		Cast aluminum	
Protection		ME RESIST	

Dimensions (in)

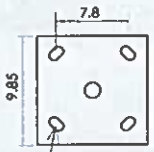


Kassio 900 Kassio 1200 Kassio 1500

Door (back of the bollard):
5.1 x 11.0 in.

In the case of a sealing block installation, recommanded dimensions:
om30 x om30 x om40

Base plate



4 anchor bolts M14/Ø16x300 (not supplied)

KASSIO

Technical Characteristics

Electrical Characteristics

- Power current up to 700mA
- Electrical class: I and II
- Incorporated driver.
- Optional surge protector or over/under voltage protection.
- Optional lighting management systems: automatic adjustment with up to 5 levels depending on the time of day, presence detection, constant flux, graduation via voltage variation, command 1-10V or DALI.

Voltage range (V)

Module 8 LED	21-24 V
Module 16 LED	42-48 V

KASSIO

Lighting performance

LED module

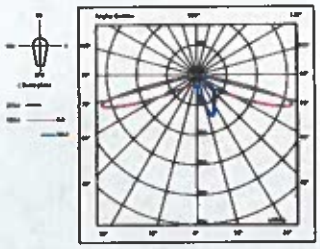
We have selected our LEDs from the best on the market for their quality and efficiency.

- LED manufacturer: CREE
- Assigned LED's life cycle: 100 000 hours.
- Lumen maintenance, ex : L85 100 000 hrs @ 350mA, 85% of the luminous flow at 100 000 hrs @ 350mA.
- Color temperature: 3000K or 4000K (other color temperatures on request)
- CRI above 70

Photometric distributions

Asymmetrical

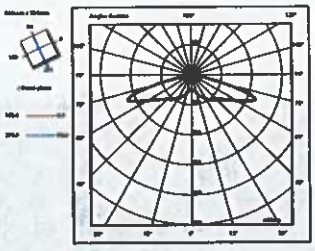
ASY08



Designed for intensive road lighting. The ASY08 lens is optimised to adapt to the typology of the area to be lit. It is ideal for pedestrian paths and cycle paths.

Circular distribution

CIR05



Designed for circular or rectangular ambient lighting. The CIR05 lens is optmised to offer broad distribution to cover maximum surface area.

Powers and luminous intensities

LUMINAIRE OUTPUT DATA (Tj @ 85°C)

3000 K	350 mA			500 mA			700 mA		
Nombre de LED / Number of LED	P_t (W)	Φ (lm)	(lm/W)	P_t (W)	Φ (lm)	(lm/W)	P_t (W)	Φ (lm)	(lm/W)
8	10.5	1010	96	14.5	1440	99	20	1900	95
16	19	2020	106	26.5	2885	109			

4000 K	350 mA			500 mA			700 mA		
Nombre de LED / Number of LED	P_t (W)	Φ (lm)	(lm/W)	P_t (W)	Φ (lm)	(lm/W)	P_t (W)	Φ (lm)	(lm/W)
8	10.5	1150	110	14.5	1560	108	20	2050	103
16	19	2300	121	26.5	3120	118			

P_t (W) = Total power consumption including driver consumption
Nominal flux (lm)
Luminous efficiency (lm/W)

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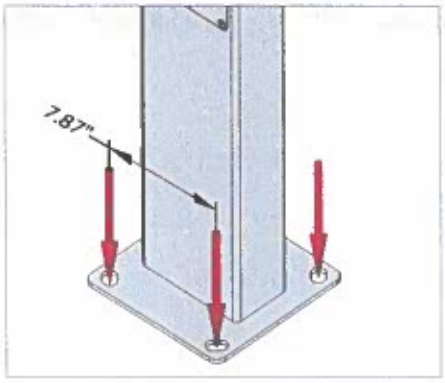
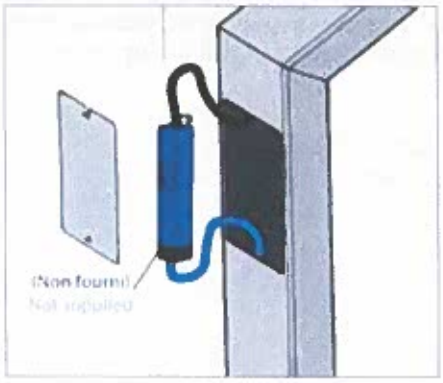
Installation & maintenance

Installation

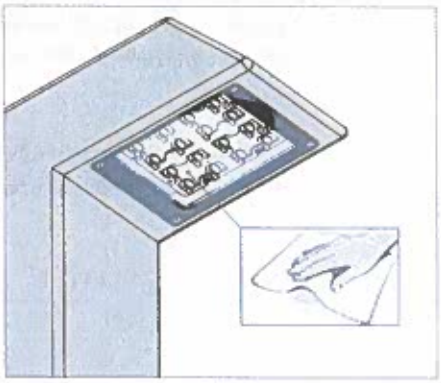


Fastening: 4 embedding rods Ø16 / M14x300mm



Door opening via 2 screws BTR for electric housing access.

Luminaire maintenance



Glass cleaning.

Ordering Information

Model	Size	# LED	CCT (K)	Drive Current	Distribution	Line Voltage	Color
Kass							
	S- (35.4")	8	3 – (3000K)	35 – (350 mA)	T2	120 V	BLK – (Black)
	M- (47.2")	16	4 – (4000K)	50 – (500 mA)		220 V	BRZ – (Bronze)
	L- (59.1")			70 – (700 mA)		277 V	SLV – (Silver)
	C - (Custom)			90 - (900mA)		347 V	WHT – (White)
						480 V	(RAL #)
						UNV	

KASSIO

Appearance

With its chisel tip, the design of the Kassio bollard is effective, clean and original. Both an element of street furniture and a lighting device, it will dress modern places as well as more classic or remote areas. With its 3 different heights and choice to paint it with one or two colors of your choice, it will fit any decor.

- **Standard colors: White, Silver, Bronze and Black.**
  All RAL colors available upon request.

Color and finish examples: